

REMARKS

Claims 26-50 were examined in the outstanding Office Action. Claims 26, 32, 33, 37, 39, 43, 44 and 45 have been amended above, without prejudice. Of these, claims 26 and 39 are independent claims. The features of claim 31 have been added to claim 26 and the features of claim 42 have been added to claim 39. Claims 31 and 42 have been canceled. Claims 26-30, 32-41 and 43-50 are now pending. No new matter has been added.

Applicant's Invention

The claimed invention facilitates the manufacturing of a plate heat exchanger, and more particularly, a plate heat exchanger having gaskets between the plates. The invention simplifies the application of the gaskets on the heat exchanger plates that are being included in the plate heat exchanger. Furthermore, the invention is directed to a heat exchanger plate and a method of manufacturing a heat exchanger plate to permit automatization of the application of the gasket.

A heat exchanger plate is provided with a curable polymer material and the polymer material is cured in a border area to form a gasket. Such plates can then be mounted together to form a plate heat exchanger. By using such plates, the manufacturing of a plate package is greatly simplified since the curable material, in an uncured state, can be extruded onto the border area of the plate and then cured. The older, relatively complicated manual mounting of a completed gasket in a gasket groove, using glue or other adhesive means to hold it in place, as explained in the background portion of the instant application, can therefore be eliminated. The extrusion of a line of curable material can be performed in an automatic manner, such as by using an industrial robot.

Claim Rejections – 35 USC § 112

Claim 37 was rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The claim was said to have insufficient antecedent basis for the term “the second side surface.” Claim 37 has been amended to depend from claim 35, instead of claim 36, and the amendment has overcome the rejection.

Double Patenting

Claims 26-28, 31-33, 36 and 38 were rejected on the grounds of nonstatutory double patenting over claim 13 of US Patent No. 7,191,821 ("the '821 patent"). Claims 29-30, 34-37 and 39-50 were also rejected on the same grounds over claims 13 and 22 of the '821 patent in view of Sumitomo et al. Patent JP 356000992 (Sumitomo et al.).

As stated in the Action, a terminal disclaimer will overcome the rejection. Applicant will file a suitable terminal disclaimer once otherwise allowable claims are acknowledged to be present in the application.

Claim Rejections – 35 USC § 102

Claims 26-28 and 38 were rejected as allegedly being anticipated by Sears (US Patent No. 5,597,453) under 35 U.S.C. 102(b).

As has been noted above, claim 26 has been amended without prejudice to include the features of now canceled claim 31. Therefore, this rejection has been overcome for at least that reason. Claims 27-28 and 38 all refer directly or indirectly to claim 26 and the rejection has therefore been overcome as to those additional claims, for at least the same reason.

Claim Rejections – 35 USC § 103

Claims 29-30, 34-37, 39-41 and 47-50 were rejected as allegedly being unpatentable under 35 U.S.C. 103(a) over Sears in view of Sumitomo et al. Furthermore, claims 31-33 and 42-46 were rejected as allegedly being unpatentable under 35 U.S.C. 103(a) over Sears in view of Sumitomo et al., and further in view of Nakamura et al. (EP 0 744 444). These rejections are respectfully traversed.

Sears was cited in the counterpart PCT application search report and discloses a plate heat exchanger having a number of embodiments. Seals 144, 166 are shown. Seal 166 may be made of a liquid sealing material such as silicone (col. 9, lines 25-29). However, liquid silicone is applied in the interspace between two adjacent heat exchanger plates, after which the liquid

silicone is allowed to cure. The sealing material will then join the two plates to each other. However, Sears does not disclose a single heat exchanger plate manufactured with a gasket cured on the single plate itself before the plate is provided with adjacent heat exchanger plates for forming a plate heat exchanger.

According to the abstract of Sumitomo et al. provided with the Japanese language patent, the reference discloses a plate heat exchanger having a gasket groove with a gasket. It appears that this gasket is a conventional gasket in the sense that it is pre-manufactured and thereafter mounted in the gasket groove in a conventional manner. The gasket and the gasket groove are provided with a partly circular cross-section as can be seen in Fig. 3 with a planar bottom. The purpose of the circular cross-section seems to be to provide a tight abutment between the gasket and the gasket groove so that heat exchanger media cannot enter between the gasket and the groove. In the claims of the instant application, however, the gasket is manufactured from a curable polymer material that is applied to and cured on a border area such that the polymer material extends along the whole, or parts of, the border area and is arranged to form a gasket or tight abutment against an adjacent plate in the plate heat exchanger. Such a construction and method is not disclosed or suggested by Sumitomo et al., as best understood.

Nakamura et al. has been cited in combination with Sears and Sumitomo et al. against claims 31-33 and 42-46. Nakamura et al. was cited in the counterpart PCT application search report. The reference relates to a composition of liquid silicone rubber for a lubricant seal. It does not refer or relate to plate heat exchangers. In any event, as is clear from the pending claims, they relate to a heat exchanger plate, a plate heat exchanger and a method for manufacturing a heat exchanger plate.

Each of the cited references is therefore distinguishable from the pending claims. It is not seen that any of the cited references disclose or suggest to one of ordinary skill in the art at the time the invention claimed herein was made, whether the references are taken alone or in combination, a single heat exchanger plate having a gasket of curable material cured thereto, or a plate heat exchanger made of such plates or a method for manufacturing such a plate, as claimed herein.

Conclusion


In any event, for at least the reasons indicated above, all pending claims are allowable and the issuance of a notice of allowance is proper and is urged.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

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Respectfully submitted,

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Richard P. Ferrara
Reg. No. 30,632

Fish & Richardson P.C.
Citigroup Center
52nd Floor
153 East 53rd Street
New York, New York 10022-4611
Telephone: (212) 765-5070
Facsimile: (877) 769-7945